REMARKS

The Office Action mailed June 8, 2004, has been received and reviewed. Claims 1-3, 5-19, and 21-48 are currently pending in the application. Claims 18, 23, 26, and 30 have been withdrawn from consideration as being drawn to a non-elected invention but the claims will be rejoined if they are ultimately dependent on an allowable generic claim. Claims 1-3, 5-17, 19, 21, 22, 24, 25, 27-29, and 31-48 stand rejected. Applicants have amended claims 1, 10, 15, 28, 29, 31-35, 41, and 43-48, canceled claims 2, 3, 5, 6, 16, 17, 19, 21, and 22, and respectfully request reconsideration of the application as amended herein.

Support for the amendments to independent claims 1, 15, and 41 is found in the as-filed specification at at least paragraphs [0019] and [0046]-[0051].

Claims 1, 10, 15, 28, 29, 31-35, 41, and 43-38 have also been amended to improve antecedent basis and/or to clarify the scope of the claims.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 5,728,969 to Otani *et al.*, in view of U.S. Patent No. 5,997,668 to Aubert *et al.*, U.S. Patent No. 5,552,000 to Shepherd, Jr., Holt *et al.* German Patent No. 37 44 680 A1, German Patent No. 100,522, French Patent No. 465,082, and French Patent No. 349,635

Claims 1-17, 19-22, 24, 25, 27-29, and 31-48 stand rejected under 35 U.S.C. § 103(a) ("Section 103") as being unpatentable over U.S. Patent No. 5,728,969 to Otani *et al.* ("Otani"), in view of U.S. Patent No. 5,997,668 to Aubert *et al.* ("Aubert"), U.S. Patent No. 5,552,000 to Shepherd, Jr. ("Shepherd"), Holt *et al.* German Patent No. 37 44 680 A1 ("Holt"), German Patent No. 100,522 (the "'522 German Patent"), French Patent No. 465,082 ("Tarnowski") and French Patent No. 349,635 ("Girard"). Claims 2, 3, 5, 6, 16, 17, 19, 21, and 22 have been canceled, rending the rejection moot as to these claims. Applicants respectfully traverse the rejection as to the remaining claims, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103 rejection:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

The obviousness rejection of claims 1, 7-15, 24, 25, 27-29, and 31-48 is improper because the cited references do not teach or suggest all of the claim limitations and do not provide a motivation to combine to produce the claimed invention.

Otani discloses a granular explosive that includes from 3-50% by weight of an aromatic dinitro compound and from 50-97% by weight of porous prill ammonium nitrate. The dinitro compound is dinitrobenzene, dinitrochlorobenzene, dinitrotoluene, dinitroxylene, dinitrophenol, or dinitronaphthalene. The dinitro compound is adsorbed into the ammonium nitrate. The granular explosive is formed by mixing the porous prill ammonium nitrate with the aromatic dinitro compound. Otani does not disclose that its granular explosive includes 2,4-dinitroanisole.

Aubert discloses a method of casting 1,3,3-trinitroazetidine ("TNAZ") that includes adding a nitro-substituted aromatic amine to a melt including TNAZ. The nitro-substituted aromatic amine is a mono-, di-, or tri-nitro or -amino compound, such as n-methyl-p-nitroaniline, 2,4-dinitroaniline, or 1,3-diamino-2,4,6-trinitrobenzene. The TNAZ is present in an amount ranging from 75-95% and the nitro-substituted aromatic amine is present in an amount ranging from 5-25% by weight. Aubert does not disclose that its explosive material includes 2,4-dinitroanisole.

Shepherd discloses an explosive composition that includes a nonaqueous emulsion of a nitrosolution of an organic self-explosive in a surfactant-in-fuel dispersion. The explosive composition is formed by dissolving the organic self-explosive in a nitrosolvent to form a

supersaturated nitrosolution. The organic self-explosive is present in the explosive composition from 50-97% by weight and the nitrosolvent is present from 5-15%. The explosive composition includes a nitramine and, optionally, a nitroaromatic compound, such as trinitrotoluene. Shepherd does not disclose that an oxidizer or a reactive metallic fuel is used in its explosive composition or that 2,4-dinitroanisole is present.

Tarnowski discloses an explosive powder that includes metallic aluminum, an aromatic nitrohydrocarbon, and ammonium perchlorate. The explosive powder includes 12-15% trinitrobenzene, 40-75% ammonium perchlorate, and 30% potassium nitrate. Tarnowski does not disclose that its explosive powder includes 2,4-dinitroanisole.

Girard discloses an explosive having a nitrated or azo derivative and a combustion supporting agent. Girard does not disclose that its explosive includes 2,4-dinitroanisole.

Holt discloses an energetic composition having from 5-25% of a polymeric binder, from 65-90% of a heteroalicyclic nitramine, and 1-15% of a plasticizer. The plasticizer is a mono-, di-, or tri-nitroaromatic compound, such as a di- or tri-nitro derivative of an alkyl- or alkoxy-benzene.

As amended, claim 1 recites a melt-pourable explosive composition comprising 30 weight percent to 70 weight percent of an organic binder comprising 2,4-dinitroanisole, 5 weight percent to 35 weight percent of at least one oxidizer, and 5 weight percent to 35 weight percent of at least one reactive metallic fuel. The melt-pourable explosive composition is pourable at a temperature in a range of 80°C to 115°C.

The cited references do not teach or suggest all the limitations of claim 1 because they do not teach or suggest a melt-pourable explosive composition that comprises "30 weight percent to 70 weight percent of an organic binder comprising 2,4-dinitroanisole." None of the cited references, except for Holt, teaches or suggests that 2,4-dinitroanisole is present in their respective compositions. While Holt teaches that its plasticizer is a di- or tri-nitro derivative of an alkyl- or alkoxy-benzene, this component is present at 1-15% of the energetic composition. As such, Holt also does not teach or suggest this limitation of claim 1.

The cited references also do not teach or suggest the limitation of "wherein the melt-pourable explosive composition is pourable at a temperature in a range of 80°C to 115°C." The Examiner states that Otani teaches "the basic invention of melt cast explosives with dinitro aromatics, oxidizer, aluminum metal fuel, etc." Office Action of June 8, 2004, p. 2. The Examiner then relies on Aubert, Shepherd, Tarnowski, Girard, Holt, and the '522 German Patent as teaching that "variation of the various notoriously well known additives, amounts and so forth would have been obvious." *Id.* However, Otani discloses that its granular explosive is produced by adsorbing the aromatic dinitro compound into the ammonium nitrate. Therefore, contrary to the Examiner's assertion, Otani does not disclose a melt-pour explosive. Since Otani does not disclose a melt-pour explosive, it necessarily does not teach or suggest this limitation of claim 1. Aubert, Shepherd, Tarnowski, Girard, Holt, and the '522 German Patent also do not teach or suggest this limitation.

Since the cited references do not teach or suggest all of the limitations of claim 1, Applicants respectfully submit that the obviousness rejection of claim 1 is improper and should be withdrawn.

Claims 7-14, 43, and 46 are allowable, *inter alia*, as depending from an allowable base claim. Claim 43 is further allowable because the cited references do not teach or suggest that the oxidizer has a single modal particle size distribution in a range of 5 to 50 microns.

The cited references also do not provide a motivation to combine to produce the claimed invention. To provide a motivation or suggestion to combine, the prior art or the knowledge of a person of ordinary skill in the art must "suggest the desirability of the combination" or provide "an objective reason to combine the teachings of the references." M.P.E.P. § 2143.01. In addition, "it is fundamental that rejections under 35 U.S.C. § 103 must be based on evidence." *In re Lee*, 61 U.S.P.Q.2d 1430, 277 F.3d 1338, 1342 (Fed. Cir. 2002). This evidence "must be based on objective evidence of record." *Id.* at 1343. When patentability depends on a question of obviousness, "rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references" is "the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis." *Id.* This rigorous showing requires the

Examiner to "explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious." *Id.* In other words, the motivation to combine can not "be resolved on subjective belief and unknown authority." *Id.* at 1344. Furthermore, the Examiner "cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies." *Id.* at 1345.

The Examiner states that Otani teaches "the basic invention of melt cast explosives with dinitro aromatics, oxidizer, aluminum metal fuel, etc." Office Action of June 8, 2004, p. 2. The Examiner then relies on Aubert, Shepherd, Tarnowski, Girard, Holt, and the '522 German Patent as teaching that "variation of the various notoriously well known additives, amounts and so forth would have been obvious." *Id.* The Examiner also states that "[i]t is well settled that optimizing a result effective variable is well within the expected ability of a person of ordinary skill in the subject art." *Id.* at p. 3. However, as discussed above, the cited references do not teach or suggest all of the limitations of claim 1. Therefore, the claimed invention does not merely optimize a result effective variable as asserted by the Examiner. As such, this statement by the Examiner is conclusory and is not an objective reason that supports combining the cited references to produce the claimed invention.

Furthermore, since Otani discloses that its granular explosive is formed by adsorbing the aromatic dinitro compound into the ammonium nitrate, Otani does not disclose a melt-pour explosive. In addition, nothing in Otani suggests the desirability of formulating its granular explosive to be a melt-pour explosive. As such, the Examiner's stated motivation to combine Otani with Aubert, Shepherd, Holt, the '522 German Patent, Tarnowski, and Girard to produce the claimed invention is improper and can only be based on the impermissible use of hindsight.

In addition, one of ordinary skill in the art would not be motivated to combine Aubert, Shepherd, Holt, the '522 German Patent, Tarnowski, and Girard with Otani because many of the cited references do not teach or suggest forming a melt-pour explosive. Out of the cited references, Aubert discloses a melt-pour explosive. Shepherd, Holt, the '522 German Patent, Tarnowski, Girard, and Otani do not suggest preparing their respective compositions by a melt-

pour process. Therefore, one of ordinary skill in the art would not be motivated to combine these references with Aubert to produce the claimed invention. Furthermore, while Aubert discloses a melt-pour explosive, the melt-pour explosive includes from 5-25% by weight of the nitro-substituted aromatic amine and there is no motivation or suggestion to adjust the amounts of this component. Therefore, nothing in Aubert provides any motivation to form a melt-cast explosive that includes from 30 weight percent to 70 weight percent of 2,4-dinitroanisole. Furthermore, nothing in Aubert provides a motivation for using a similar formulation in a granular explosive, such as the granular explosive in Otani.

The cited references also do not provide any motivation for using 2,4-dinitroanisole in such a melt-pourable explosive composition. As such, even if the cited references were combined, the claimed invention would not be produced because the resulting melt-pour explosive composition would not comprise 30 weight percent to 70 weight percent of 2,4-dinitroanisole, for the reasons previously discussed.

Since the cited references do not teach or suggest all of the claim limitations and do not provide a motivation to combine, Applicants respectfully request that the obviousness rejection be withdrawn.

As amended, claim 15 recites a melt-pourable explosive composition that comprises 30 weight percent to 70 weight percent of an organic binder comprising 2,4-dinitroanisole, 5 weight percent to 35 weight percent of at least one inorganic oxidizer, and 5 weight percent to 35 weight percent of at least one reactive metallic fuel. The melt-pourable explosive composition is pourable at a temperature in a range of 80°C to 115°C.

Since claim 15 recites the limitations of "30 weight percent to 70 weight percent of an organic binder comprising 2,4-dinitroanisole" and "wherein the melt-pourable explosive composition is pourable at a temperature in a range of 80°C to 115°C," claim 15 is allowable for substantially the same reasons discussed above for claim 1. The cited references also do not provide a motivation to combine to produce the invention recited in claim 15 for substantially the same reasons discussed above for claim 1. As such, the obviousness rejection of claim 15 is improper and should be withdrawn.

Claims 24, 25, 27-29, 31-40, 44, and 47 are allowable, *inter alia*, as depending from an allowable base claim. Claim 44 is further allowable because the cited references do not teach or suggest that the inorganic oxidizer has a single modal particle size distribution in a range of 5 to 50 microns.

As amended, claim 41 recites a melt-pourable explosive composition that comprises 30 weight percent to 70 weight percent of an organic binder comprising 2,4-dinitroanisole, 5 weight percent to 35 weight percent of at least one inorganic oxidizer, and 5 weight percent to 35 weight percent of at least one reactive metallic fuel. The melt-pourable explosive composition is melt-pourable at a temperature in a range of 80°C to 115°C, undergoes an onset of thermal decomposition at a temperature that is at least 55.5°C higher than the temperature at which the melt-pourable explosive composition becomes pourable, and exhibits a card gap value of less than 105, a dent depth in a range of 0.713 cm to 0.872 cm, and a total energy of detonation of 11.6 kJ/cc to 14.2 kJ/cc.

Since claim 41 recites the limitations of "30 weight percent to 70 weight percent of an organic binder comprising 2,4-dinitroanisole" and "wherein the melt-pourable explosive composition is pourable at a temperature in a range of 80°C to 115°C," claim 41 is allowable for substantially the same reasons discussed above for claim 1. The cited references also do not provide a motivation to combine to produce the invention recited in claim 41 for substantially the same reasons discussed above for claim 1. As such, the obviousness rejection of claim 41 is improper and should be withdrawn.

Claims 42, 45, and 48 are allowable, *inter alia*, as depending from an allowable base claim. Claim 45 is further allowable because the cited references do not teach or suggest that the inorganic oxidizer has a single modal particle size distribution in a range of 5 to 50 microns.

ENTRY OF AMENDMENTS

The amendments to claims 1, 10, 15, 28, 29, 31-35, 41, and 43-48 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application.

CONCLUSION

Claims 1, 7-15, 18, and 23-48 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,

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Date: September 7, 2004
JAW/KAH/sls:ljb
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